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(54) PROPYLENE RESIN COMPOSITION

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a composition excellent in moldability by selecting a composition comprising a product of crosslinking of an aromatic vinyl/hydrogenated diene block copolymer and a propylene resin and having a specified extension viscosity/shear rate viscosity ratio and a specified melt drawability.

SOLUTION: There is provided with a propylene resin composition containing 1-30 wt.% product of crosslinking of a block copolymer comprising an aromatic vinyl polymer block (A), a hydrogenated conjugated diene block having a 1,2-bond unit content of at least 65 mol.% and a degree of hydrogenation of at least 90 mol.% or an aromatic vinyl random copolymer block (B) and a taper block (C) comprising an aromatic vinyl and a conjugated diene, being hydrogenated and having a gradually increasing aromatic vinyl content, being of an A-B, A-B-A or A-B-C type and having a conjugated diene content of 50-97 wt.% is provided. This composition is characterized in that it can be drawn so as to satisfy the relationship: $d \leq 0.25D$ (wherein (d) is the diameter of a strand extruded from a circular die having an inside diameter D), and that the ratio between the extension viscosity and the shear viscosity both of which are measured at the same temperature and the same shear rate is equal to or larger than 4.

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the propylene resin constituent which is excellent in fabrication nature.

[0002]

[Description of the Prior Art] Conventionally, although propylene resin is well known as general-purpose polymeric materials which are excellent in thermal resistance, when blow molding, a vacuum forming, pressure forming, film shaping, lamination shaping, spinning, and foaming are presented, producing problems, such as thickness deviation, the neck in, a surging, Resonance, and foam breaking, is known. Elongational viscosity is related to many of problems of these poor shaping, and generally, if elongational viscosity is fully larger than the shear viscosity in the same temperature and the same rate of strain, it is known that a moldability will improve (M. the Shinohara Society of Rheology, Japan, Vol.19 p-118 (1991)). However, there is usually no elongational viscosity of a polypropylene regin at about 3 times of the shear viscosity in the same rate of strain.

[0003] Then, since the elongational viscosity of a polypropylene regin is increased, the molecular weight distribution of propylene resin is extended, or the approach of adding branch-type low density polyethylene (LDPE) is performed.

[0004] Furthermore, the polypropylene which has long-chain branching is developed and the commercial scene is presented in recent years (Plastic Engineering p-82 March '91).

[0005]

[Problem(s) to be Solved by the Invention] However, it is difficult to make elongational viscosity / shear viscosity in the same temperature of propylene resin, and the same rate of strain larger than 3, and the amelioration effectiveness of fabrication nature has it. [of the approach which has extended the molecular weight distribution of propylene resin enough, and carries out them] [inadequate]

[0006] On the other hand, since the polypropylene which has long-chain branching was inferior to melting ductility, poor shaping produced it in many cases.

[0007] Then, this invention offers the propylene resin constituent suitable for the blow molding which solved the above-mentioned technical problem, a vacuum forming, pressure forming, film shaping, lamination shaping, spinning, foaming, etc.

[0008]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, as a result of inquiring wholeheartedly, this invention persons find out having the working characteristic excellent in the propylene resin constituent which has a specific property, and came to complete this invention.

[0009] namely, this invention -- the following -- from the bridge formation object and propylene resin of the aromatic series vinyl-hydrogenation diene system block copolymer which fulfills the property shown in (a) and (b) -- becoming -- the following -- it is related with the propylene resin constituent characterized by fulfilling the property of (c) and (d).

[0010] (a) The polymer block unit which makes an aromatic series vinyl compound a subject (A), The joint unit originating in 1 of conjugated diene and 2 association is more than 65 mol %. The hydrogenation conjugated diene block unit with which hydrogenation more than of 90 mol % of the double bond originating in conjugated diene was carried out, and it is saturated, or a random copolymerization block unit with an aromatic series vinyl compound unit (B), And/or, consist of an aromatic series vinyl compound and conjugated diene, and hydrogenation of the double bond originating in conjugated diene is carried out. (A)-(B) (A)-(B)- which consists of a taper block unit (C) which an aromatic series vinyl compound increases gradually -- (A) or (A)-(B)- it is the block copolymer shown by (C).

[0011] (b) The ratios of the unit originating in an aromatic series vinyl compound and conjugated diene are an aromatic series vinyl compound / conjugated diene =3 / 97 - 50/50 (weight ratio).

[0012] (c) It can extend so that the diameter d of the strand at the time of extruding from the circular dice which has the bore diameter D may serve as $d \leq 0.25xD$.

[0013] (d) The ratios of the maximum of the elongational viscosity measured in the same temperature

and the same rate of strain and shear viscosity are elongational viscosity / shear viscosity >=4.

[0014] Below, this invention is explained at a detail.

[0015] As propylene resin which constitutes the propylene resin constituent of this invention That what is necessary is just what is generally known as crystalline propylene resin For example, a propylene homopolymer, the propylene-ethylene random copolymer of 0.5 - 12 % of the weight of ethylene contents, The propylene ethylene and the alpha olefin system ternary polymerization object of 0.5 - 20 % of the weight of alpha olefin contents, such as 0.5 - 12 % of the weight of ethylene contents, and 1-butene, High impact polypropylene of 1 - 60 % of the weight of ethylene contents, the polypropylene with which long-chain branching was introduced, syndiotactic polypropylene, etc. are mentioned, these one sort or two sorts or more are used together, and it is used. Moreover, as for propylene resin, it is desirable that the melt flow rates (it is hereafter described as MFR.) in 230 degrees C and 2.16kg load are 0.01-100g / 10 minutes.

[0016] The aromatic series vinyl-hydrogenation diene system block copolymer used in order to obtain the bridge formation object of the aromatic series vinyl-hydrogenation diene system block copolymer which constitutes the propylene resin of this invention From the propylene resin constituent obtained being excellent in fabrication nature, weatherability, and thermal resistance The joint unit originating in 1 of the polymer block unit (A) which makes an aromatic series vinyl compound a subject, and conjugated diene, and 2 association is more than 65 mol %. The hydrogenation conjugated diene block unit with which hydrogenation more than of 90 mol % of the double bond originating in conjugated diene was carried out, and it is saturated, or a random copolymerization block unit with an aromatic series vinyl compound unit (B), And/or, consist of an aromatic series vinyl compound and conjugated diene, and hydrogenation of the double bond originating in conjugated diene is carried out. The taper block unit which an aromatic series vinyl compound increases gradually ((A)-(B which consists of C)), It is desirable that it is the block copolymer shown by (C). (A) -(B)- (A) or (A)-(B)- It excels in the handling nature of an aromatic series vinyl-hydrogenation diene system block copolymer. Since the propylene resin constituent obtained is excellent in flexibility and fabrication nature, it is desirable that the ratios of the unit originating in an aromatic series vinyl compound and conjugated diene are an aromatic series vinyl compound / conjugated diene =3 / 97 - 50/50 (weight ratio).

[0017] Here, as an aromatic series vinyl compound, for example, styrene, t-butyl styrene, alpha-methyl-styrene, p-methyl styrene, divinylbenzene, 1, and 1-diphenyl styrene, N, and N-diethyl-p-aminoethyl styrene, vinylpyridine, etc. are mentioned, and especially styrene and alpha methyl styrene are desirable. Moreover, as a conjugated diene compound, 1,3-butadiene, 1,3-pentadiene, 2-methyl-1,3-pentadiene, 1, 3-hexadiene, 4, the 5-diethyl -1, 3-octadien, 3-butyl -1, 3-octadien, a chloroprene, etc. are mentioned, and especially 1,3-butadiene and an isoprene are desirable.

[0018] Furthermore, 30000-1 million, and that it is especially 50000-600000 have [this aromatic series vinyl-hydrogenation diene system block copolymer] the desirable number average molecular weight of the polystyrene conversion from becoming possible to construct a bridge easily and excelling also in handling nature.

[0019] Such an aromatic series vinyl-hydrogenation diene system block copolymer can be obtained by adding hydrogen to this block copolymer further, after carrying out the living anionic polymerization of a taper block unit (C) or the block unit (A) in an organic solvent if needed further, using an organoalkali metal compound as an initiator and obtaining a block copolymer, an approach which is indicated by JP,3-72512,A, i.e., a block unit, (A), a block unit (B), and.

[0020] The approach which especially a limit does not have as an approach of constructing a bridge in an aromatic series vinyl-hydrogenation diene system block copolymer, for example, constructs a bridge with an electron ray, a peroxide, etc. is mentioned.

[0021] And since the moldability of the propylene resin constituent obtained is excellent when constructing a bridge with an electron ray, it is desirable to consider as 10 or more kGrays of exposures.

[0022] Moreover, when performing heating bridge formation by the peroxide As a peroxide, for example, methyl ethyl ketone peroxide, cyclohexanone peroxide, 3, 3, 5-trimethyl hexa non peroxide, methylcyclohexanone peroxide, Ketone peroxides, such as methyl acetoacetate peroxide and

acetylacetone peroxide; 1 and 1-screw (tert-butyl peroxide) - 3, 3, 5-trimethylcyclohexane, A 1 and 1-bis (tert-butyl peroxide) cyclohexane, 2, and 2-bis(tert-butyl peroxide) octane, Peroxy ketal;t-butyl hydroperoxide, such as 2 and 2-bis(tert-butyl peroxide) butane, n-butyl -4, and a 4-bis(tert-butyl peroxide) hexane, A cumene hydroperoxide, G isopropylbenzene hydroperoxide, P-menthonaphthene hydroperoxide, 2,5-dimethylhexane-2,5-dihydroperoxide, Hydroperoxide, such as 1, 1, 3, and 3-tetramethyl BUCHIRUHAIDORO peroxide; Di-t-butyl peroxide, T-butyl-cumyl-peroxide, dicumyl peroxide, alpha, and alpha'-bis(tert-butyl peroxide-m-isopropyl) benzene, Dialkyl peroxide, such as 2, the 5-dimethyl -2, and 5-G (tert-butyl peroxide) hexyne -3; Acetyl peroxide, Isobutyl peroxide, octanoyl peroxide, decanoyl peroxide, RAURO reel peroxide, 3 and 3, 5-trimethylhexanoyl peroxide, Diacyl peroxide, such as Succin acid peroxide, benzoyl peroxide, and 2,4-dichlorobenzyl peroxide; G isopropyl peroxy carbonate, Di-2-ethylhexylperoxycarbonate, di-n-propyl peroxy dicarbonate, Bis(4-t-butyl cyclohexyl) peroxy dicarbonate, Di-2-ethoxyethylperoxydicarbonate, di-methoxyisopropyl peroxydicarbonate, G (3-methyl-3-methoxy butyl) peroxy dicarbonate, Peroxi dicarbonate, such as diaryl peroxy dicarbonate; T-butyl peroxyacetate, T-buthylperoxy isobuthylate, t-butyl peroxy laurate, T-butyl peroxybenzoate, t-butyl peroxybenzoate, Di-t-butyl peroxyisophthalate, 2, the 5-dimethyl -2, 5-G (benzoylperoxy) hexane, Peroxy ester, such as t-butyl peroxide isopropyl KARUBONATO, is mentioned, and these can mix and use one sort or two sorts or more.

[0023] When performing peroxide bridge formation, it is also possible to use together a bridge formation accelerator and a co-cross-linking agent. Furthermore, as a bridge formation accelerator For example, N and N-diphenylguanidine, N, and N-G (o-tolyl) guanidine, Guanidine derivative;N, such as N and N-o-tolyl guanidine, N-dibutylthiourea, An N and N'-diethylthio urea, dilauryl thiourea, 2-mercaptop imidazoline, Thiourea, such as trimethyl thiourea and a tetra-methylthio urea; Dibutyl xanthogenic acid zinc, Xantho gel acid chloride, such as sodium isopropylxanthate and isopropyl xanthogenic acid zinc; Zinc dimethyldithiocarbamate, Zinc diethyldithiocarbamate, zinc dibutyldithiocarbamate, Ethyl phenyl dithiocarbamic acid zinc, N-pentamethylene dithiocarbamic acid zinc, Dibenzyl dithiocarbamic acid zinc, sodium dimethyldithiocarbamate, Sodium diethyldithiocarbamate, sodium dibutyldithiocarbamate, Dimethyl dithiocarbamic acid copper, diethyldithiocarbamic acid TERIRIUMU, A piperidinium pentamethylene dithio carbamate, a pipecolic PIPERIJIMECHIRU dithio carbamate, Dithiocarbamate, such as dimethyl dithiocarbamic acid iron; A hexamethylenetetramine, Aldehyde ammonia system compounds, such as an acetaldehyde aniline and a butyraldehyde aniline; Mercaptobenzothiazole, Mercaptobenzothiazole sodium salt, dibenzothiazyl disulfide, Thiazole system compounds, such as 2-(4-morpholino dithio) benzothiazole and 2-(2,4-dinitrophenyl) mercaptobenzothiazole; Tetramethylthiurammonosulfide, Tetraethylthiuram monosulfide, tetramethylthiuramdisulfide, A tetraethylthiuram disulfide, tetrabutylthiuram disulfide, Thiuram sulfide, such as G pentamethylene thiuram tetrasulfide; Mercaptobenzothiazole, Thiazole system compound;N-cyclohexyl-2-benzothiazole sulfenamide, such as dibenzothiazyl disulfide and 2-mercaptobenzothiazole zinc, Sulfenamide compounds, such as N-oxydi ethylene-2-benzothiazole sulfenamide and N-t-butyl benzothiazole sulfenamide, etc. are mentioned, and these bridge formation accelerators may be used combining one sort or two sorts or more.

[0024] As a co-cross-linking agent, for example P and quinonedioxime, P-P dibenzoyl quinonedioxime, An N-methyl-N'-4-dinitroso aniline, dinitroso benzene, Lauryl methacrylate, ethylene glycol dimethacrylate, Triethylene glycol dimethacrylate, tetra-ethylene glycol dimethacrylate, Poly ethylene glycol dimethacrylate, trimethylolpropane tri-methacrylate, Diaryl fumarate, diaryl phthalate, tetra-aryloxy ethane, A thoria reel SHIANU rate, aryl methacrylate, maleimide, FENIRU maleimide, N, N', m-phenylene bismaleimide, A maleic anhydride, an itaconic acid, a divinylbenzene, a diaryl melamine, Diphenylguanidine, a divinyl horse mackerel peat, vinyl toluene, 1, 2-polybutadiene, Liquefied styrene-butadiene copolymer rubber, a JIPENTAMECHIREN thiuram PENTA sulfide, a mercapto bonds thiazole, sulfur, etc. are mentioned, and they are used by one sort or two sorts or more among these, mixing.

[0025] Moreover, it is also possible to use together the bridge formation promotion assistant represented by a zinc white, an active white, a surface-preparation zinc white, zinc carbonate, a litharge, the

magnesium oxide, etc. in the case of bridge formation, a dispersant, etc.

[0026] In order to raise the moldability of the propylene resin constituent of this invention, MFRa/MFRb>1 and that it is especially MFRa/MFRb>5 have desirable MFR (MFRb) after giving bridge formation with MFR (MFRa) before constructing a bridge in an aromatic series vinyl-hydrogenation diene system block copolymer. In addition, MFR is JIS. It is the value measured on the temperature of 230 degrees C, and the conditions of 2.16kg of loads based on K6758.

[0027] The diameter d of the strand extruded from the circular dice at the time of performing evaluation of melting ductility is able to extend [$d \leq 0.25xD$ and] the propylene resin constituent of this invention so that it may be preferably set to $d \leq 0.20xD$ to the bore diameter D of a circular dice. When it cannot extend here so that it may be set to $d \leq 0.25xD$, it is inferior to the moldability at the time of presenting fabrication, since this resin constituent is inferior to melting ductility, and since extending to altitude becomes impossible, the mold goods obtained become the bad thing of an appearance.

[0028] And the approach generally learned can be used as a measuring method of melting ductility, for example, the approach using a real fabrication machine, the approach using a capillary tube mold rheometer, etc. are mentioned. As for measurement temperature conditions, it is desirable to carry out at general 170-250 degrees C as a Measuring condition of propylene resin. Moreover, there is especially no limit also about the bore diameter D of the dice used for measurement, and die-length L. Since measurement becomes possible easily, a dice with a bore diameter [of $D = 0.1\text{-}5\text{mm}$] and a die length of $L = 0.1\text{-}100\text{mm}$ is used. The extrusion rate of a strand = It is desirable to measure in 0.02-2m part [for /] and residence-time 3 - 30 minutes, and it sets to this invention. It asked for the diameter d of the strand with which it was taken over at the time of measuring with a capillary tube mold rheometer using the dice of ratio-of-length-to-diameter=2.95/1(mm) at the maximum taking over rate which can be extended on the conditions for 190-degree-C, and cylinder fall velocity part [for /] and residence-time 6 minutes of 10mm.

[0029] the ratio of the maximum of the elongational viscosity which measured the propylene resin constituent of this invention in the same temperature and the same rate of strain, and shear viscosity -- elongational viscosity / shear viscosity ≥ 4 -- it is elongational viscosity / shear viscosity ≥ 4.5 preferably. Here, when it is elongational viscosity / shear viscosity < 4 , at the time of fabrication, the propylene resin constituent obtained becomes easy to produce poor shaping, such as thickness deviation, the neck in, Resonance, and a surging, and is inferior in fabrication nature. In addition, measurement temperature has desirable 170-250 degrees C which is real molding temperature as the measuring method, and, as for a rate of strain, it is desirable to carry out by 0.01-1sec-1. And about measurement of shear viscosity, it is desirable to carry out with a cone-disk mold viscometer, and it is Ferry work as the measuring method, for example. 'Viscoelastic Properties of Polymers' Third Edition, Wiley, New The approach indicated by York (1980) can be mentioned. Moreover, as a measuring method of elongational viscosity, O.Ishizuka, et.al., Polymer, Vol.21, and the approach indicated by p-164 (1980) can be mentioned, for example. And measurement of the elongational viscosity in this invention was performed by 190 degrees C and rate-of-strain $0.1\text{--}0.05\text{sec}^{-1}$ using the elongational viscosity meter of a Meissner mold. Moreover, using the cone-disk mold viscometer, measurement of shear viscosity measured at 190 degrees C, and asked for the shear viscosity in rate-of-strain 0.1sec-1.

[0030] Since thickness deviation is reduced and fabrication nature is excellent, as for especially the propylene resin constituent of this invention, it is desirable that melting tension is 3g or more. The Measuring condition of melting tension is the same as the Measuring condition of melting ductility.

[0031] Since especially the propylene resin constituent of this invention turns into a resin constituent which is excellent in working characteristics, such as melting ductility, it is desirable that the activation energy of a flow is 35 - 45 kJ/mol. Here, the measuring methods of the activation energy of a flow are two or more temperature of the arbitration below the approach indicated by "the volume "lecture rheology" and for Society of Rheology, the macromolecule publication meeting", etc., i.e., the decomposition temperature of 170-degree-C or more propylene resin constituent, and can be searched for by measuring the dynamic modulus of the propylene resin constituent of this invention.

[0032] Moreover, the melt flow rate measured by 230 degrees C of the propylene resin constituent of

this invention and 2.16kg load is desirable from having a good working characteristic with it being the range for 0.01-100g / 10 minutes.

[0033] The bridge formation object of propylene resin / aromatic series vinyl-hydrogenation diene system block copolymer although especially the blend rate of propylene resin and the bridge formation object of an aromatic series vinyl-hydrogenation diene system block copolymer is not limited, since the propylene resin constituent excellent in a moldability and rigidity is obtained in the propylene resin constituent of this invention (weight ratio) = it is desirable that it is 99 / 1 - 70/30. Moreover, although the manufacture approach of this propylene resin constituent is arbitrary, after, blending propylene resin, the approach of blending the bridge formation object of an aromatic series vinyl-hydrogenation diene system block copolymer with a kneader, a roll, a Banbury mixer, a 1 shaft extruder, a twin screw extruder, etc., propylene resin, and the aromatic series vinyl-hydrogenation diene system block copolymer before bridge formation for example, the approach of constructing a bridge, while performing melting kneading etc. is mentioned.

[0034] It responds to the propylene resin constituent of this invention at the need. For example, a calcium carbonate, A mica, talc, a silica, a barium sulfate, a calcium sulfate, a kaolin, Clay, pyrophyllite, a bentonite, a SERISA night, a zeolite, Nepheline SHINAITO, attapulgite, wollastonite, a ferrite, A calcium silicate, a magnesium carbonate, a dolomite, an antimony trioxide, Inorganic bulking agents, such as titanium oxide, ferrous oxide, molybdenum disulfide, a graphite, gypsum, a glass bead, glass powder, glass balun, glass fiber, a quartz, and quartz glass, and organic and an inorganic pigment can also be blended. Moreover, a crystalline-germ agent, a rarefaction agent, an anti blocking agent, a release agent, an antistatic agent, a slipping agent; an antifogger, lubricant, a heat-resistant stabilizer, UV stabilizer, light stabilizer-proof, a weatherproof stabilizer, a foaming agent, an antifungal agent, a rusr-proofer, an ion trap agent, a flame retarder, a fire-resistant assistant, etc. may be added if needed.

[0035] Furthermore, to the propylene resin constituent of this invention, unless it deviates from the purpose of this invention, it is also possible to blend other resin and rubber. In this case, a compatibilizer may be added if needed as further component. as such resin or rubber -- a line -- high density polyethylene -- a line -- low density polyethylene, branch-type low density polyethylene, and an ethylene-vinylacetate copolymer (EVA) -- An ethylene ethyl acrylate copolymer, Pori (1-butene), Pori (1-hexene), A polyamide, polyester, Pori (4-methyl-1-pentene), a styrene thermoplastic elastomer, Polyolefine system thermoplastic elastomer, ethylene and an alpha olefin random-copolymer elastomer, and its bridge formation object, Ethylene, an alpha olefin diene random-copolymer elastomer, and its bridge formation object, Natural rubber, acrylonitrile-butadiene rubber, butadiene rubber, polyisoprene rubber, styrene butadiene rubber, silicone rubber, poly polynorbornene rubber, and chloroprene rubber are mentioned. Furthermore, as a compatibilizer, the block or graft copolymer represented by an adhesive polymer; polyolefine-polyamide graft or block copolymers, such as acid denaturation polyolefine and saponification EVA, etc. is mentioned, for example.

[0036] The propylene resin constituent of this invention is fabricated by various mold goods by methods of fabricating arbitration, such as the film fabricating method, a vacuum-forming method, a pressure-forming method, a blow molding method, the calender fabricating method, the profile extrusion fabricating method, spinning, and a foaming method.

[0037]

[Example] Although an example is given to below and this invention is explained to it, and this invention is not limited to these examples. [these] [instantiation]

[0038] The various measurement in an example and the example of a comparison is shown below.

[0039] - measurement of elongational viscosity - MELTEN Aging of elongational viscosity was measured by rate-of-strain 0.1sec-1 using Rheometer (made in an Oriental energy machine factory). Measurement temperature was made into 190 degrees C.

[0040] - aging of shear viscosity was measured by rate-of-strain 0.1sec-1 using measurement of shear viscosity - a cone-disk viscometer (rheology company make, trade name MR-500). Measurement temperature was made into 190 degrees C.

[0041] - using measurement of the activation energy of a flow - a cone-disk viscometer (rheology

company make, trade name MR-500), dynamic viscoelasticity measurement was performed in the temperature of 190 degrees C and 230 degrees C, and it asked for the activation energy of a flow. [0042] - the capillary tube rheometer (made in an Oriental energy machine factory and a trade name KYAPI log -- rough) estimated measurement of melting ductility - melting ductility. ratio of length to diameter of 9.55mm and a dice made barrel temperature 190 degrees C, the barrel bore made it as 2.95/1 (mm), it is fall velocity the conditions for /of 10mm of a cylinder, and the maximum taking over rate which can be extended was measured. The diameter of the taken-over strand was measured, and it ** (ed) for the dice diameter, and considered as the standard of melting ductility.

[0043] - in measurement of measurement of melting tension - melting ductility, the melting tension at the time of a taking over rate being a part for 10m/was measured.

[0044] - measurement of MFR - JIS Based on K6758, it measured on the temperature of 230 degrees C, and the conditions of 2.16kg of loads.

[0045] - the sheet with a thickness of 1.0mm was fabricated using the evaluation - Tanabe Plastics Machinery make of a sheet moldability, and 50phi sheet making machine (VS50 extruder). The temperature of C1:180 degree C, C2:200 degree C, C3:220 degree C, C4:230 degree C, and a die head was set as 230 degrees C, and the cylinder temperature set the screw speed as 50rpm. The vacuum forming was performed for the obtained sheet using the compressed air and the vacuum forming machine (made in the Asano lab). For 30 seconds, the contraction ratio of a mold set heater temperature 600 degrees C, and heating time set it to 0.75.

[0046] an example 1 hydrogenation block copolymer (the Japan Synthetic Rubber Co., Ltd. make and trade name Dina Ron D1320P -- Styrene 4 mol% in MFR3.8g / [the 65% of the amounts of vinyl association before hydrogenation is carried out, number average molecular weight (polystyrene reduced property) 95000, and] 10 minutes alpha and alpha'-bis(tert-butyl peroxide-m-isopropyl) benzene (the Nippon Oil & Fats make --) as trade name par butyl P2500ppm and a bridge formation assistant -- thoria reel isocyanurate (the Nippon Kasei Chemical make --) Trade name TAIC1500ppm were added and heating bridge formation was carried out by performing for 3 minutes at 180 degrees C, and kneading with an internal mixer (made in an Oriental energy machine factory, a trade name lab PURASUTO mill, 100ml of content volume).

[0047] MFRs of the bridge formation object of the obtained hydrogenation block copolymer were 0.45g / 10 minutes.

[0048] Melting kneading of the bridge formation object and propylene homopolymer (the Chisso make, the trade name Chisso polypropylene K1011, 10 MFR:1.0g /, minutes) of the obtained hydrogenation block copolymer was carried out with the roll kneading machine set as 180 degrees C by the weight ratio of 1:9. During kneading, the hindered phenol system stabilizer (the Ciba-Geigy make, trade name IRUGA NOx 1010) and the Lynn system stabilizer (the Ciba-Geigy make, trade name IRUGAFOSU 168) were added as a thermostabilizer, 5000 ppm of calcium stearates were added as 10000 ppm and lubricant, respectively, and the propylene resin constituent was obtained. The same actuation was repeated several times, was carried out and the 5kg sample was obtained.

[0049] The maximum ratio of the shear viscosity of the obtained propylene resin constituent and elongational viscosity, melting ductility, melting tension, and the activation energy of a flow were measured, and the moldability was evaluated. The result is shown in Table 1.

[0050] Except having set 5000 ppm and thoria reel isocyanurate to 10000 ppm for example 2alpha and alpha'-bis(tert-butyl peroxide-m-isopropyl) benzene, the propylene resin constituent was obtained by the same technique as an example 1, and fabrication nature was evaluated with evaluation of various rheology properties. The result is shown in Table 1.

[0051] In addition, MFRs of the bridge formation object of a hydrogenation block copolymer were 0.10g / 10 minutes.

[0052] Evaluation of the rheology property of the propylene homopolymer used in example of comparison 1 example 1 and a moldability was performed. The result is shown in Table 1.

[0053] Except having used the example of comparison 2 hydrogenation block copolymer, without constructing a bridge, the constituent was obtained by the same technique as an example 1, and

evaluation of a rheology property and a moldability was performed. The result is shown in Table 1.
 [0054] Evaluation of a rheology property and a moldability was performed using example of comparison 3 long-chain branching installation polypropylene (made in Montel, trade name PF-814, 10 MFR:3g /, minutes). The result is shown in Table 1.

[0055]

[Table 1]

	剪断粘度と 伸長粘度の 最大値の比	ストランド径 とダイス径の 比の最小値	溶融強力 (g)	流動の活性 化エネルギー (kJ/mo1)	シート 成形性
実施例 1 2	5. 8 2. 3	0. 066 0. 09	14. 0 16. 5	40. 2 40. 5	良好 良好
比較例 1 2 3	3 3 3. 9	0. 065 0. 064 0. 44	12. 0 11. 8 53. 0	39. 9 40. 3 48. 3	偏肉あり 偏肉あり 偏肉あり

[0056]

[Effect of the Invention] According to this invention, the propylene resin constituent which is excellent in fabrication nature is obtained.
